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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/054,618	01/22/2002	Takashi Goh	72887	5787

22242 7590 03/26/2004

FITCH EVEN TABIN AND FLANNERY  
120 SOUTH LA SALLE STREET  
SUITE 1600  
CHICAGO, IL 60603-3406

EXAMINER

LIN, TINA M

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 03/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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# Office Action Summary

Application No.

10/054,618

Applicant(s)

GOH ET AL.

Examiner

Tina M Lin

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19 and 20 is/are allowed.
- 6) ☒ Claim(s) 1-6, 8, 13 and 15-18 is/are rejected.
- 7) ☒ Claim(s) 7, 9-12 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

### **DETAILED ACTION**

Receipt is acknowledged of papers submitted by the International Bureau under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3-5 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In regards to claim 3, it is unclear so to how the annealing regions difference is distance is measured between the optical waveguide and the annealing region again. In regards to claims 4, 5, and 17, it is unclear how the annealing regions differ in regards to a slit or a trench or a slit width or by the depth of the trench.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 6, 8, 13, 15, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,084,050 to Ooba et al. and in view of U.S. Patent 6,546,161 to Okuno et al. In regards to claims 1, 6, 8, 13, 15, and 18, Ooba et al. discloses an interferometer with an optical coupler (72), a plurality of optical waveguides connected to the coupler (73) and

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two types of thin film heater regions (74 & 75) that are near the optical waveguide with a trimmed thin film heater region to change the optical path length. (Figure 13) But Ooba et al. fails to disclose how the thin film heater changes the optical path length by the TO effect. However, Okuno et al. further discloses the details of the thin film heater. Okuno et al. discloses that the heat is increased to change the refractive index and therefore changing the optical path length through a thermo-optic phase shifter, also referred to as a thin film heater by Okuno et al. (Column 2, Figure 10) Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have changed the optical path length of an interferometer by changing the refractive index of the annealing region.

In regards to claims 2 and 16, Ooba et al. and Okuno et al. discloses all discussed above but fails to mention the width of the annealing regions. However, Applicant discloses as Prior Art in Figure 1 the thin films applied to the waveguide are different widths in an optical interferometer. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have used thin films of different widths.

#### ***Allowable Subject Matter***

Claims 7, 9-12, and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record in this application fails to disclose or reasonably suggest an interferometer with a set of annealing regions on an optical waveguide, where the path length is trimmed by changing the refractive index of the optical waveguide by annealing and where there is an additional fixed delay circuit on the optical waveguide to provide a delay dependant polarization state. The prior art of record also fails to disclose in the

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claimed interferometer two 2x2 optical couplers with a path length difference between the two trimmed waveguides to be an odd multiple of  $\lambda/2$  for a transverse electrical polarization and an even multiple of a transverse magnetic polarization or vice versa. The prior art of record further fails to disclose the annealing region having a width equal to or greater than 2.6 times the distance from a core center to a top surface of the cladding or a width equal to or less than 1.4 times the distance from the core center to the top surface of the cladding.

Claims 19 and 20 are allowable. The prior art of record in this application fails to disclose or reasonably suggest an interferometer with an annealing region having a width that is equal to or greater than 2.6 times the distance from a core center to a top surface of the cladding or a width equal to or less than 1.4 times the distance from the core center to the top surface of the cladding.

The documents submitted by applicant in the Information Disclosure Statement have been considered and made of record. Note attached copy of form PTO-1449.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tina M Lin whose telephone number is (571) 272-2352. The examiner can normally be reached on Monday-Friday 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TML

  
Brian Healy  
Primary Examiner